

Microlepidoptera in Scotland, 1978

By A. M. EMMET *

My wife and I visited Scotland between the 19th of July and the 9th of August 1978. Our entomological objects were as follows: —

- (1) To study the life histories of certain northern species of Microlepidoptera so that these may be described in forthcoming volumes of MBGBI.
- (2) To study the nepticulids feeding on *Rubus chamaemorus*.
- (3) To study *Stigmella nanivora* (Petersen), a form or species of uncertain status feeding on *Betula nana*.
- (4) To look for evidence of the presence in Scotland of *Etainia albimaculella* (Larsen), a north European species feeding on *Arctostaphylos uva-ursi*.
- (5) To make as many vice-county records as possible of leaf-mining lepidoptera, continuing the work of previous visits in 1972 and 1975.

Since the purpose of our visit was to collect information rather than specimens, I shall not give the usual travelogue but deal with the results achieved species by species, introducing discussion where necessary. Our precise route is of little consequence; we made records in the following vice-counties: — 76, 78, 79, 80, 81, 82, 85, 86, 87, 90, 92, 94, 95, 96, 97, 98, 99, 101, 105, 106, 107 and 108. We also visited North Northumberland (VC 68), one of the least recorded English vice-counties, and made one or two records on our journey north in Nottinghamshire (VC 56) and Mid-west Yorkshire (VC 64). We were accompanied, and greatly assisted, by Mr. E. C. Pelham-Clinton on the 23rd of July and from the 28th of July to the 4th of August, and by Mr. J. M. Chalmers-Hunt from the 28th to the 30th of July. In all, we made 322 Scottish and 27 English vice-county records which are apparently new; these will appear in future volumes of MBGBI or, in the case of the species already described in Volume I, in the proposed supplement which will give over 600 vice-county records made since publication.

NEPTICULIDAE

Ectoedemia argyropeza (Zeller). Although the larva does not appear in the blade of the leaf until October, records can quite easily be made from the ovum, which is laid in a constant position on the side of the petiole of an aspen leaf. The moth's range extends considerably further north than had been supposed, reaching Aviemore (VC 95) and Toomich (VC 96).

Fomoria septembrella (Stainton). This species, which was first recorded in Scotland in 1976 from Midlothian (VC 83) by Mr. K. Bland, was found in five other central Scottish counties. Its principal foodplant in Scotland seems to be *Hypericum pulchrum*.

Etainia albimaculella (Larsen). This species, described by Adamczewski (1947), is quite likely to occur in Scotland, but is particularly difficult to detect. The larva mines a twig and

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petioles of *Arctostaphylos* in late summer and winter, moving in spring into the base of the leaf where it pupates. We spent a whole morning searching bearberry at Tulloch Moor (VC 96) and E.C.P.-C. found a sprig in which the petioles had undoubtedly been mined. The sprig, which was this year's growth, was kept under observation until it withered, but there was no sign of a larva or further feeding. Our timing was wrong; the leaves containing pupae probably drop off the plant in spring, like those containing *Fomoria weaveri* (Stainton) from *Vaccinium vitis-idaea* and the feeding of the next generation of larvae would hardly be noticeable as early as July. It would be well worth the while of a diligent and patient microlepidopterist to search for it in April or May.

Stigmella aurella (Fabricius). Since the larva of this species mines during the winter, it is unable to withstand severe frost and its history in Scotland is one of alternate extension and contraction of range, according to the mildness or severity of the winter. In 1978 we found mines only in one maritime vice-county, namely Kintyre (VC 101).

S. splendidissimella (Herrich-Schäffer) and *S. tengstroemi* (Nolcken). I have previously written that though we have a nepticulid feeding on cloudberry (*Rubus chamaemorus*) in the Highlands of Scotland, its identity is uncertain (Emmet in Heath *et al.*, 1976: 223). During our Scottish visit of 1975, my wife and I collected tenanted mines at two altitudes on Cairngorm (VC 96) and near the Lecht Road (VCs 92 and 94). Several moths which emerged in August, 1975 appeared to be referable to *S. tengstroemi* but were destroyed when a clumsy batman dropped the drawer which contained them. Early in 1976 more adults emerged, this time of two species, one resembling *S. tengstroemi* and the other *S. splendidissimella*. The mystery of the conflicting descriptions of "*S. tengstroemi*" in our literature was now explained, but further doubt was engendered over whether the second species really was *S. splendidissimella*. At the time of collection I failed to observe any differences in larval coloration or mines suggesting that two species were involved and the mines I had pressed included none which were characteristic of *S. splendidissimella*. Mr. E. S. Bradford kindly made dissections and drawings of the genitalia of both sexes of the Scottish "*splendidissimella*" and British specimens from Wicken Fen for comparison; we could find no significant differences. Thus there was an apparent conflict between the evidence of the specimens themselves and their biology.

In 1978 we revisited the exact localities where we had collected in 1975 and now that we knew what to look for, there was no difficulty in separating the mines into two species. Those in the cloudberry growing at 1,600 feet just above the tree-line were *S. splendidissimella*, whereas those on plants growing at about 2,600 feet and above the start of the ski-lift were *S. tengstroemi*. Evidently all the mines I pressed in 1975 were from the higher ground and represented *S. tengstroemi* only.

In both species the ovum is usually laid on the underside of a leaf; thereafter the larvae and mines differ as follows: — *S. splendidissimella*. Larva greenish yellow, head light brown, ganglia greyish; mine a long, rather angular, irregular gallery, mainly with linear frass leaving broad, clear margins, but also with short areas of cloudy or dispersed frass. Cocoon grey-green.

S. tengstroemi. Larva pale yellow, head and ganglia yellow-brown; mine shorter and more contorted, often ending in a small blotch; the frass is at first rather cloudy, filling the gallery, but later is broken-linear, more copious in quantity, leaving only narrow clear margins. Cocoon yellow-brown to brown.

S. tengstroemi, at any rate in captivity, is partially bivoltine, about half the adults emerging in August after a pupal period of two or three weeks, whereas the remainder lie over until the next spring. Whether wild August adults could parent a second generation able to finish feeding before the foodplant dies down is questionable. *S. splendidissimella*, on the other hand, appears to be wholly univoltine in the Highlands.

A long series labelled "*tengstroemi*" in the Tyerman collection (BMNH) consists entirely of *S. splendidissimella*. Likewise, the specimens bred by Threlfall and now in the Dorset County Museum, Dorchester are referable to *S. splendidissimella* (Brown, 1967); Threlfall himself doubted whether they were *S. tengstroemi*. Tutt (1899: 247) considered that there was only one authentic British specimen of *S. tengstroemi*; this was collected as a larva south of Loch Rannoch, Perthshire by Carrington and given to Sang who bred the adult which he later gave to Dr. Mason. I am not aware of the species having been reared in Britain in the hundred years which elapsed between Carrington's specimen and my own.

We found *S. splendidissimella* in two other localities and on three other foodplants. On the 21st of July my wife found its mines on wood avens (*Geum urbanum*) beside the R. Leven at Markinch, Fifeshire. Searching of the area revealed that they were much more plentiful on wild raspberry (*Rubus idaeus*). Then on the 2nd of August E.C.P.-C. guided us to the enclosures at Inchnadamph, West Sutherland (VC 108); these are patches of mountainside fenced off to exclude grazing sheep and deer and consequently supporting rich vegetation. E.C.P.-C. had found vacated mines there on stone bramble (*R. saxatilis*) in the past and we wished to establish their identity. The mines still occurred plentifully and the larval coloration, the mine-form and, later, the colour of the cocoons all indicated that they were *S. splendidissimella*. It is interesting that mines on cloudberry in the same enclosure were, on the same grounds, referable to *S. tengstroemi*.

The validity of *S. tengstroemi* as a distinct species is questioned by continental authors. Borkowski (1975: 506) considers *S. poterii* (Stainton, 1857), *S. tengstroemi* (Nolcken, 1971) and *S. serella* (Stainton, 1888) to be conspecific. Certainly

the adults look alike and the genitalia have not been examined in enough specimens to show whether the slight differences which have been observed are constant. Yet if they are treated as one species on three foodplants, more problems are raised than solved. *S. poterii* feeds on salad burnet (*Poterium sanguisorba*) and is almost entirely confined to chalk and limestone; *S. tengstroemi* is limited to cloudberry on mountains; and *S. serella* to tormentil (*Potentilla erecta*) growing in damp situations amongst heather or long grass. Often two of these foodplants are found growing together on the same ground, but I know of no instance where both plants are attacked. For example, in the Highlands tormentil is sympatric with cloudberry and very much more common; yet diligent searching failed to disclose any feeding on tormentil in the areas where *S. tengstroemi* occurs. *S. serella* does, however, occur on lower ground in the Highlands; indeed, its type locality is in Perthshire. Tormentil and salad burnet grow side by side in the Burren, Co. Clare, yet only *S. serella* is recorded in Ireland. I could cite numerous other instances. It seems that the moth associated with each foodplant is unable (or at any rate disinclined) to transfer to another. Though the mines of *S. poterii* and *S. serella* are similarly formed, those of *S. tengstroemi* are dissimilar. My specimens of *S. tengstroemi* seem marginally larger than those of the other two species. Pending further study the three are best regarded as distinct.

S. dryadella (Hofmann). This was scarce but mines were found at Invernaver Nature Reserve and Eribol (West Sutherland, VC 108), and at Loch Kishorn (Wester Ross, VC 105), the last being a new vice-county record.

S. paradoxa (Frey). It is remarkable that this species which was added to the British list only in 1969 (Emmet, 1970) has already been recorded from 43 vice-counties. This year's records brings the Scottish vice-county total to 11, the range extending as far north as Mid Perthshire (VC 88).

S. betulicola f. *nanivora* (Petersen). I was sent mines in July, 1974 from Inverness-shire, but the larvae were dead on arrival. Since virtually nothing is known of *nanivora* in Britain, I was particularly keen to find tenanted mines. I obtained details of the locality which is on the mountains west of the Alvie Estate, MR NH 859118, with plants scattered thinly over a wider area. Permission is necessary, but willingly granted by the agent. We tramped up on one of the wettest days of a cold and wet holiday and had no difficulty in locating patches of *Betula nana*; some of them have been marked with posts by the botanists. However a long and thorough search revealed larval feeding of *Atemelia torquatella* (Zeller) in plenty, but no sign of the nepticulid. The inference is that *nanivora* is essentially univoltine, feeding in the early autumn, and only producing a summer brood in favourable seasons—a small crumb of information to set against the disappointment of failure in one of our objectives.

Other nepticulids for which new vice-county records

were obtained were *Ectoedemia mediofasciella* (Haworth), *E. pulverosella* (Stainton), *Trifurcula immundella* (Zeller), *Stigmella sorbi* (Stainton), *S. plagicolella* (Stainton), *S. salicis* (Stainton), *S. auritella* (Skala), *S. myrtillella* (Stainton), *S. trimaculella* (Haworth), *S. floslactella* (Haworth), *S. tityrella* (Stainton), *S. perpygmaeella* (Doubleday) (*pygmaeella* Haworth)), *S. hemargyrella* (Kollar), *S. atricapitella* (Haworth), *S. ruficapitella* (Haworth), *S. svenssoni* (Johansson), *S. malella* (Stainton), *S. hybnerella* (Hübner), *S. nylandriella* (Tengström) (*aucupariae* (Frey)), *S. magdalenae* (Klimesch) (*nylandriella* sensu auctt.), *S. crataegella* (Klimesch), *S. betulicola* (Stainton), *S. microtheriella* (Haworth), *S. lapponica* (Wocke) and *S. confusella* (Wood).

INCURVARIIDAE

Records were made of *Phylloporia bistrigella* (Haworth), *Incurvaria pectinea* (Haworth) and *Lampronia oehlmanniella* (Hübner).

HELIOZELIDAE

Heliozela resplendella (Stainton). When the map was printed (MBGBI, I: 303) there were only three vice-county records in Scotland; now there are 16, extending to the north coast at Borgie Bridge, West Sutherland (VC 108).

H. hammoniella (Sorhagen) (*betulae* (Stainton)). First noted in Scotland in the south-west in 1975, this species is now known in nine vice-counties, the most northerly record being at Dallachoilish, Argyll Main (VC 98).

LYONETIIDAE

Leucoptera orobi (Stainton). This was recorded in East Inverness-shire (VC 96) as well as in Moray (VC 95), where it is well-known. Both larvae and adults were found and a gap in the knowledge of the life history was filled. The cocoon is spun on a leaf like that of *L. laburnella* (Stainton) and is constructed in a similar manner, each end having a sprung orifice which opens under pressure from within; consequently the sloughed larval skin is extruded from the cocoon on pupation. With *L. lotella* (Stainton) there is no such opening and the larval exuviae are retained within the cocoon.

Paraleucoptera sinuella (Reutti). A thorough search was made of the aspens near Aviemore station where this species used to occur, but no trace of its mines could be found.

Bucculatrix capreella (Krogerus). Mines, free-feeding larvae and cocoons were found near Kincaig, East Inverness-shire (VC 96) and adults were bred. Descriptions were made for MBGBI and West Inverness-shire (VC 97) was added as a new vice-county record.

New vice-county records were also made for *Leucoptera laburnella* (Stainton), *L. spartifoliella* (Hübner), *Lyonetia clerkella* (Linnaeus), *Bucculatrix nigricomella* (Zeller), *B. cidarella* (Zeller), *B. ulmella* (Zeller) and *B. demaryella* (Duponchel).

(To be continued)